Edible land snail *Helix pomatia's* exploitation in Central Romania - legislation, evolution, perspectives

VOICHIȚA GHEOCA
Department of Environmental Sciences and Physics
Lucian Blaga University of Sibiu
Ion Rațiu Street 5-7, Sibiu
ROMANIA
vgheoca@yahoo.com http://www.stiinte.ulbsibiu.ro/

Abstract: - The increased demand of snails on the European market, especially during the last century, lead to an overexploitation in most of West European countries, and consequently forced the expansion of this practice toward Eastern Europe. In Romania, edible land snail exploitation started in 1956, and its evolution was marked by changes in political regime and legislation. The exploited amount increased considerably during the last decades, even if the legislation apparently became more restrictive. For some social categories harvesting snails in spring is already a tradition and an important source of income. Often the harvest conditions concerning the snail dimension are violated, causing significant mortalities in subadult snails. The present legislation must be reinforced with control mechanisms in order to permit a sustainable exploitation.

Key-Words: - Helix pomatia, edible land snail, exploitation, conservation, Transylvania

1 Introduction

Easy to find and collect and rich in protein, land snails were since prehistoric time used as food source [1, 2]. Many communities developed an entire culture around this animals, starting from believes and superstitions translated in arts and traditions [3, 4], continuing with various utilizations in alimentation [5], medicine [6, 7] pharmacy [8], or more recent applications in cosmetics and medical diagnosis [9]. The tradition of eating snails is related also to their abundance. In Europe the largest land snail populations are developed by several circum-Mediterranean species, as *Theba pisana, Eobania vermiculata, Otala lactea, Otala punctata* highly tolerant towards high temperatures and small amount of precipitation. The mentioned species are intensely consumed by different local communities from France, Italy, Spain, and Greece, as well as from the North African countries, and are still sold in local markets [8, 9, 10]. The most appreciated land snails remain however the species of the Helix genus, *H pomatia, H. aspersa, H. lucorum*, not just due to the large size, but also to their gastronomic qualities – taste, consistency and even colour. The increased demand of snails on the European market, especially during the last century, had multiple effects. Thus, the overexploitation associated with habitat degradation and fragmentation, lead in several species to a drasticall reduction in number. This is the case of *Helix pomatia*, whose commercial exploitation is prohibited in Western Europe, but still going on in East-European countries [11, 12]. The increased demand and the decrease of natural offer, led to the development of snail farming. Initiated in Western European countries (particularly France, Italy, Belgium), heliciculture was expanded in recent decades in Eastern Europe (Romania, Bulgaria, Greece, etc.), with different local experiences. The accidental introduction of several species in many cases ended with new invasive species, a menace for crops and native snail species [13, 14, 15, 16, 17]. This material aims to analyse the evolution of edible land snail *Helix pomatia's* exploitation in the central Romania, considering the legislation, administrative structures involved and the perception of individual collectors.

2 Methods

In order to investigate the evolution of edible land snail exploitation, data concerning the authorized quantities for exploitation, and the authorized collecting centres were requested from Regional Environmental Protection Agency – Sibiu. Available information included individuals and legal entities authorized to collect terrestrial gastropods, the quantities authorized, collection area and authorized collection centres. In order to

reveal the process from the perspective of collectors, questionnaires were made relating to the collection and its features in recent years: conditions of collection, amounts collected, most intensively exploited areas, and a profile of the collector.

3 Edible land snails' exploitation

3.1. European and national legislation

In Europe large-scale exploitation of edible snails began in France, where in the nineteenth century was already extensively practiced, as a result of increased market demand. In the early twentieth century this country already reached the inability to supply the internal market on the one hand due to significant numerical decrease of snails, and on the other hand as a result of lack of collectors. To supply the expanding market, France appeals to other Western European countries. Subsequently agricultural development and habitat degradation deteriorate even more Helix pomatia's natural populations, initially in France and then in the rest of Western Europe. As a reaction, since 1979 *H. pomatia* is subject to special protection, starting France and then in other western European countries. Specific regulations of each country specify the conditions for noncommercial exploitation (generally not during the reproductive period, between 1 April and 30 June inclusive, and only the individuals with a shell diameter over 30 mm). So, *Helix pomatia* is listed in Annex III of Bern Convention, and Annex V of Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive), appendices on vulnerable species of animals whose exploitation must be subject to management. As a result, throughout the European Union, in the absence of restrictive regulations, which prohibit commercial collection, this is made only on authorizations basis which stipulates the amount that can be collected by individual collectors, the collection area and species. In Romania, there is no tradition concerning the consumption of snails. They were occasionally consumed in various regions of the country, especially in Banat and Oltenia, without this becoming a tradition. Approaching French culture in the nineteenth century and early twentieth century also led to a takeover of some dietary habits, including the famous "escargot". Until after World War I snails brought from Transylvania and Banat ware sold in grocery stores in Bucharest.

Between 1956-1989 the export of snails was performed through several specialized cooperatives of former state, the most important, IOMCOOP Sibiu was responsible of the 75% of exported amount. Between 1990-1994 the absence of a legal framework has resulted in an explosion of exports and penetration in Romania of Western European companies setting up processing plants for snails as those of Stremt (Alba County) and Fântânele (Mures County). In 1993 Romania signed the Convention on the conservation of wildlife and natural habitats in Europe, adopted at Berne on September 19, 1979. As a result, starting 1994 the export of live or processed gastropods becomes possible only with the aprouval of local environment protection agencies. This regulation has led to a drastic decrease of exported amount.

In 2001 is adopted a procedure for harvesting activities, capture and / or acquisition and domestic marketing and export of plant and animal wildlife, and their importation. This procedure remains in force until 2008, being replaced by Order 410/2008 for the approval of the authorization procedure for harvesting, capture and / or purchase and / or internal marketing, export or import of mine flowers, fossils, plants and animals. The new legislation also covers the size of collected animals, being allowed to collect all snails with a shell diameter over 30 mm. If before 1990 were collected individuals with diameter between 28 and 36 mm, allowing restoration of populations from adult individuals above that size, after 1990, they started to collect all individuals with diameter over 30 mm shell. Although this value is generally what is required in most European countries, it enables the removal of a large amount of adult individuals, from the population. Given that the species reaches sexual maturity in the third year of life, at a shell diameter of 35 mm, this means that in these conditions one shall collect all adult individuals.

3.2. The evolution of edible land snails exploitation in Central Romania

After 1990, the collection of edible land snails was taken over by different individuals or private companies, from the old units IOMCOOP Sibiu was the only one to continue this type of activity until 2003. Quantities exported by IOMCOOP between 1984-2003 are presented in Table 1. Point out that before 1990, this amount represent about

ISBN: 978-1-61804-195-1

75% of the snails exported by Romania. Currently the main companies dealing with collection, processing and marketing of snails in Transylvania are POMAROM Alba Iulia, ROLUX - Haţeg, EGANPROD - Fântânele (Mures), ESCARGO - Tg. Mures, BIOPROD - Avrig. Several smaller companies collect and / or process snails locally. In Sibiu and Brasov counties during tha last seven years the authorized amount increased with increasing collection potential and the increased european market demand (Fig. 1).

Table 1. Amount exported between 1984-2003 by IOMMCOOP Sibiu

Year	Quantity (tones) (meat and live animals)	**Year**	Quantity (tones) (meat and live animals)
1984	71 (320)	**1994**	24 (108)
1985	72 (324)	**1995**	56 (269)
1986	55 (248)	**1996**	19 (86)
1987	90 (405)	**1997**	43 (193)
1988	71 (320)	**1998**	49 (220)
1989	83 (373)	**1999**	54 (243)
1990	53 (238)	**2000**	0
1991	92 (414)	**2001**	26 (120)
1992	56 (252)	**2002**	4 (18)
1993	55 (247)	**2003**	16 (72)

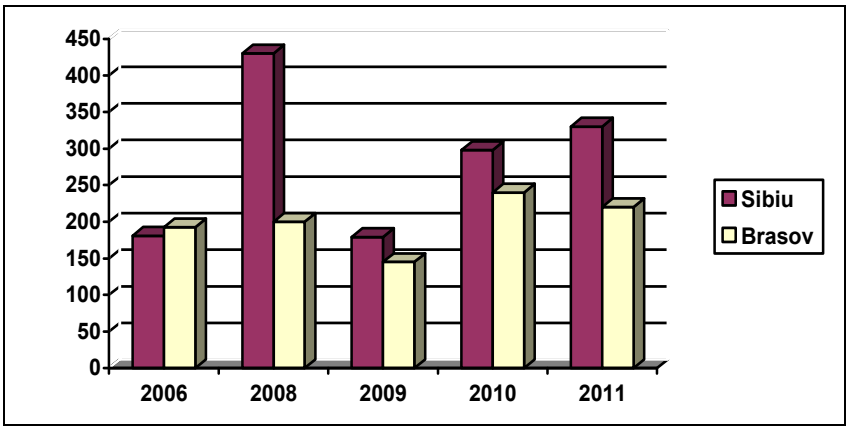

Figure 1. Authorized quantities for exploitation in 2006-2011 in Sibiu and Braşov counties (in tonnes)

Comparing these values with those exported before 1990, where we have a maximum of about 550t / year exported by Romania (extrapolating at national level the amount exported by IOMCOOP Sibiu) is observed that this quantity is exceeded by the values exported during the last years by the two counties, Sibiu and Brasov.

Authorizations for collection are emitted by local environmental protection agencies based on the values of collection potential, evaluated each year by authorized companies. Table 2 shows the potential collection of 2012. The method used to establish the exploitable amount is complex and takes into account a number of issues like the area of specific habitats, climatic condition, accessibility, amount extracted during the previous year. The most sensible element of this formula is the way to assess the total quantity of snails. Given the scarcity of data on the actual state of *Helix pomatia's* populations, the assessment is made using the vegetation maps without knowing the real density of snails in each type of habitat.

There is no data on actual amounts collected; consequently the only way to assess the process is through the authorizations emitted by environmental protection agencies and by questioning the actual snail collectors. The interest in collecting snails is reflected in distribution of collection points.

ISBN: 978-1-61804-195-1

Table 2. The exploitable amounts for 2012 (study requested by SC. Bioprod SRL and made by SC.USI SRL.)

County	Exploit. amount (t)	County	Exploit. amount (t)	County	Exploit. amount (t)	County	Exploit. amount (t)
Alba	484	Cluj	319	Hunedoara	721	Prahova	269
Argeş	491	Călăraşi	36	Harghita	430	**Sibiu**	**330**
Arad	437	Caraş-Severin	770	Ilfov	43	Sălaj	190
Bacău	365	Constanţa	61	Ialomiţa	41	Satu Mare	137
Bihor	403	Covasna	248	Iaşi	162	Suceava	414
Bistrita-N	405	Dâmboviţa	223	Mehedinţi	247	Timiş	230
Brăila	45	Dolj	148	Maramureş	432	Tulcea	48
Botoşani	89	Galaţi	62	Mureş	379	Teleorman	465
Braşov	**360**	Gorj	435	Neamţ	285	Vâlcea	235
Buzău	240	Giurgiu	62	Olt	91	Vrancea	189
						Vaslui	484

In 2010 in Sibiu County were authorized over 200 collection points, whose distribution is shown in Figure 2. As noted in the figure, in the north of the county the number of authorized collection centres is much higher than in the southern half. An explanation of this distribution may be social, i.e. the northern half of the county has a greater number of people in social groups likely to be interested in collecting snails (unemployed people and especially Roma).

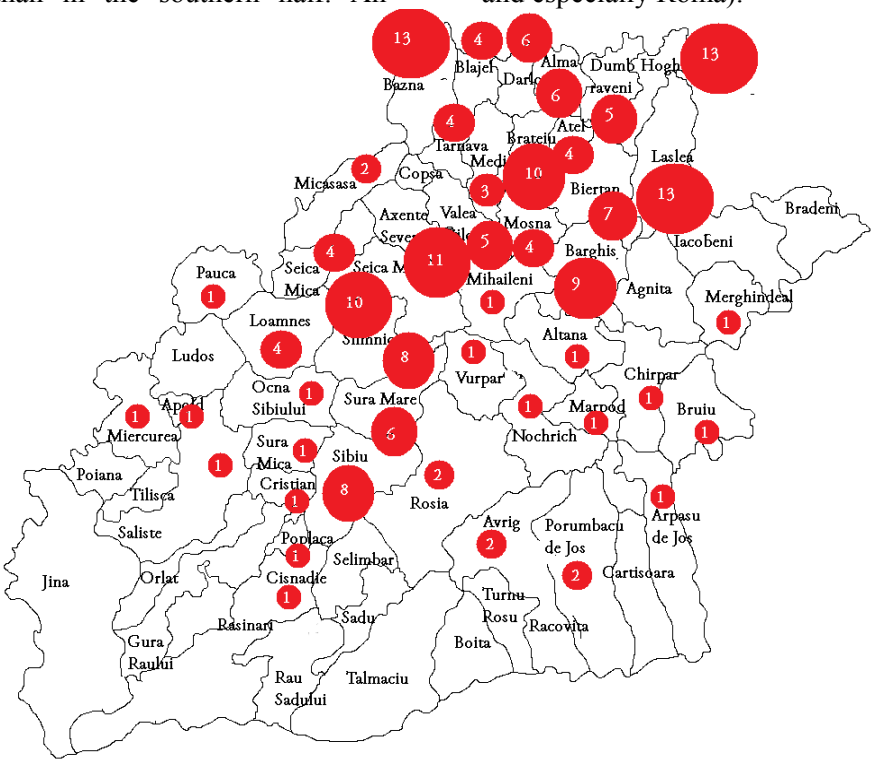

Figure 2. Distribution of collecting centres authorized in 2012 in Sibiu County. Data from Regional Environmental Protection Agency Sibiu (ARPM Sibiu)

More de 50% of collectors travel up to 10-20 km in order to collect the snails. There are also people, especially young people and the elderly who prefer to collect near the village of residence, up to a distance of 5-10 km, or even less. This technically doubles the pressure of collection on populations

ISBN: 978-1-61804-195-1

near the villages. For most respondents, collecting snails is an annual activity, and entire communities, consisting of 50-150 families are generally involved.

All respondents stated that they use as a criterion in identifying snails form, colour and size, however field evaluation of size is most often only visually. Only 3.5% of respondents use the measuring ring, all these people ware from the same village. The remaining respondents said they did not use any means of measuring the size of snails. The centres are using a sieve and the snails that pass through it are rejected. This method has as effect that inevitably snails smaller than 30 mm (shell diameter) are not taken up and the people in charge are forced to find a solution for them. A percentage of 94.22% of respondents stated they have stayed with situations where animals were rejected. Theses snails are most commonly thrown anywhere (68% of cases) or release at / near the center (25% of cases). Sometimes the snails are feed to pigs and ducks. From small, isolated, villages snails are gathered by cars that come regularly. Sometimes snails are kept in bags for several days after gathering, than are cast, and few of them survive. This occurs especially towards the end of the collection period, when the pick-ups are less frequent.

Another aspect followed in the questionnaire is related to the amount collected. Thus the largest number of collectors (27%) stated that collect between 100-200 kg each year and a rate of 22% collects over 200 kg in one year. The average amount is 126 kg/ person, which means that a family can collect on average 300 to 500 kg in a season.

We also intended to identify how people perceive the evolution of snail abundance in the area of collection (Figure 3). Most of the respondents (54.5%) stated that the number of snails has dropped, 33% consider that is unchanged, and 12.5% have perceived an increase. The last one is mostly the opinion of people had started gathering snails for several years, and reflects short term fluctuations due to climatic variations.

Even collected sometimes every day during one or two months, snails are not eaten, and this is most probably the case in entire Romania. Only 1% of collectors actually eat snails, and just a small number of them (16%) declare to have knowledge of people eating snails in the community to which they belong. Eating snails is rather seen as reprehensible, people often expresses disgust for these animals and reject the possibility of eating them.

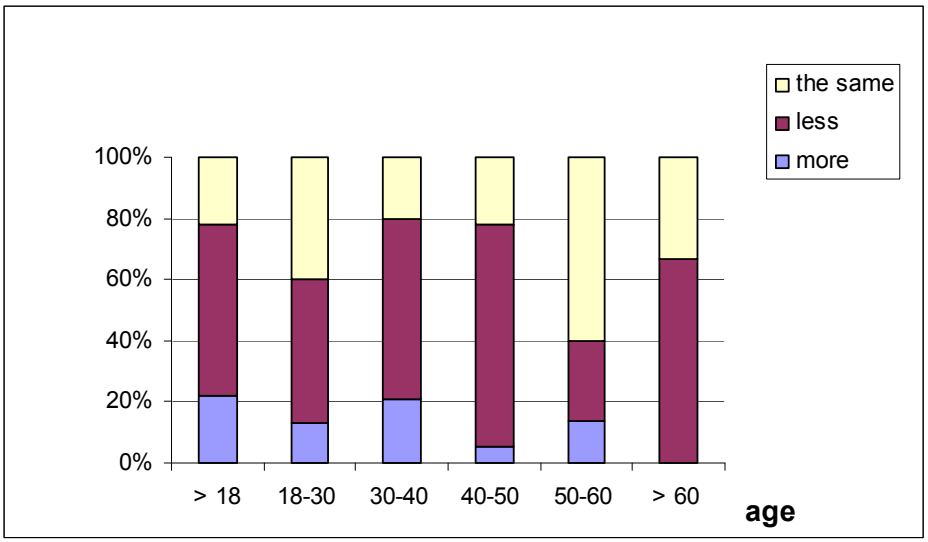

Figure 3. The perception concerning the numerical dynamics of Helix pomatia

Questionnaire results allow us to draw a profile of snail collector. They are illiterate or less educated, without permanent income or low income, mostly Roma, but also other people in the same situation. In areas analyzed whole Roma community are involved during the spring in the collection snails, which despite the low purchase price, ranging from 1 to 1.5 RON per kilogram, is an important way to supplement incomes during the two months of activity. Maintaining this already traditional practice

ISBN: 978-1-61804-195-1

in these communities, depends on the ability to implement a sustainable exploitation.

4 Conclusion

Implementation of management measures should allow conservation of this species and also maintain local exploitation practices as important source of income. The existence of a legal framework governing the collection is a defining element from the conservative point of view, but we emphasize the importance of law enforcement mechanisms, and the correct assessment of available amount of snails. This requires the involvement of decision makers who manage the countryside and its users by defining new appropriate measures. A mismanagement of natural populations by allowing annual extraction exceeding the species' recovery capacity could lead to the decline of these species in our country but also in other Eastern European countries, where is still well represented but where the pressure of collection is elevated. We believe that without clear evidence of the harvested amount and assessment of actual state of *Helix pomatia* at least for intensely exploited areas, is impossible to implement a sustainable exploitation, in order to permit the species' conservation.

References:

[1] Lubell, D., Prehistoric edible land snails in the circum-Mediterranean: the archaeological evidence, *J.-P. Brugal y J. Desse* (dir.), Petits animaux et sociétés humaines. Du complément alimentaire aux ressources utilitaires. XXIV rencontres internationales d'archéologie et d'histoire d'Antibes, Antibes, APDCA, 2004a.: 77-98.

[2] Lubell, D. Are land snails a signature for the Mesolithic-Neolithic transition?, Documenta Praehistorica, 2004b 31: 1-24.

[3] Cranga, F., Cranga Y,. L'escargot dans le Midi de la France. Approche iconographique, *Mémoires de la Société archéologique du Midi de la France*, 1997, 57 : 71-90.

[4] Duhart F. Caracoles y sociedades en Europa desde la antigüedad. Reflexiones Etnozoológicas, *STVDIVM. Revista de Humanidades*, 2009, 15: 115-139.

[5] Navarro, J. Los caracoles terrestres ibéricos de interés gastronómico.*Quercus* 1991, 61: 18-25.

[6] Campion, M. The structure and function of the cutaneous glands in Helix aspersa. *Journal of Microscopical Science* 1961, 102(2): 195-216.

[7] Dwek M.V., Ross H.A., Streets A.J., *Helix pomatia* agglutinin lectinbinding oligosaccharides of aggressive breast cancer. *Int J Cancer* 2001, 95:79–85.

[8] Arrébola Burgos, J.R., Alvarez Halcón, R.M., La explotación de los caracoles terrestres en españa: aspectos ecológicos y socioculturales, *Temas de antropología aragonesa* nº 11/ 2001: 139 – 172.

[9] Arrébola, J. R. *Caracoles terrestres de Andalucía.* Manuales de Conservación de la Naturaleza nº 1. Consejería de Medio Ambiente.Junta de Andalucía 2002.

[10] Aubert C., *Le marché français et l'économie de la production de l'escargot*. Éd. de l'ITAVI. 1993.

[11] Andreev, N, Assessment of the status of wild populations of land snail (escargot) *Helix pomatia* L. in Moldova: the effect of exploitation, *Biodiversity and conservation,* 2007, Volume 15, Number 9, 2957-2970.

[12] Jeločnik, M., Ivanović, L., Bekić, B., Collection of wild plant and animal species as a factor of rural development: Case study of Republic of Serbia. Scientific Papers Series Management, Economic Engineering In Agriculture And Rural Development 2010, Vol. 10 (3): 209-213.

[13] Sakovich NJ., Integrated Management of Cantareus aspersus (Müller) (Helicidae) as a Pest of Citrus in California. In: Barker GM (ed) Molluscs as Crop Pests, 2002, CABI Publishing, Cambridge, MA USA, pp 353-360,

[14] Juricková L., Kapounek F., Helix (Cornu) aspersa (O.F. Müller, 1774) (Gastropoda: Helicidae) in the Czech Republic *Malacologica Bohemoslovaca*, 2009, 8: 53–55.

[15] Sanderson, G. and W. Sirgel. Helicidae as pests in Australian and South African grapevines, pp. 255-270. In G.M. Barker, editor. 2002. *Molluscs as crop* CABI Publishing, New York, NY. 468 pp.

[16] Ueshima, R., M. Okamoto, and Y. Saito. Eobania vermiculata, a land snail newly introduced into Japan. *Chiribotan* 2004, 35: 71-74.

[17] USDA. Pests not known to occur in the United States or of limited distribution, No. 22: 1982 Giant African Snail. USDA-APHIS-PPQ.

[18] USDA-APHIS. New Pest Response Guidelines. 2005, Giant African Snails: Snail Pests in the Family 30 pp.